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CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture



CIAT internal seminars series

Human welfare in Honduras and Natural Resource
Management... the search for the missing link!

Monk
**Grégoire Leclerc, Helle Ravnborg, Andy Nelson, Bruno Barbier,
Patrice Couillaud, Tonny Oyana, ron Knapp, Jacqui Ashby.**
Cali, June 2, 1999 *done pme*

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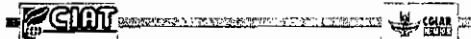
Consultative Group on International Agricultural Research

Human welfare in Honduras and natural resources management

...the search for the missing link!



Grégoire Loicerc - Helle Ravaborg - A. Nelson - B. Barbier
- Penrice Coullaud - Tony Oyana - Ron Knapp - Jacqui Ashby -



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Poverty: the need for indicators

- CIAT is doing research on poverty...
 - ...to find target population
 - ...as a mean to monitor change and impact
 - ...to find the drivers of poverty
 - ...as an element for community empowerment

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After all, our mission is to contribute
to the alleviation of poverty!

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The talk will consist...

- In describing poverty measures (national and local) and their geographical distribution
- To see how we can link the local and national indicators to produce better ones
- To see how we can combine indicators with natural resources and the importance of a geographical approach.

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Examples of "universal" indicators

- World bank LSMS (poverty line -income based)
- UNDP Human Development Index (human capacity : literacy+life expectancy)

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National indicators

- introduce local 'ingredients'
- are based on surveys and census data according to expert knowledge
- are used to take decisions and assign resources

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Indices from population and housing census

- It is possible to find proxy variables in a census.
- Our method is to produce a weighted combination of normalized variables, using a threshold value for each variable.
- We work from raw census data (~4 Million records and >100 variables)
- there is no single recipe

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Two examples of composite indices

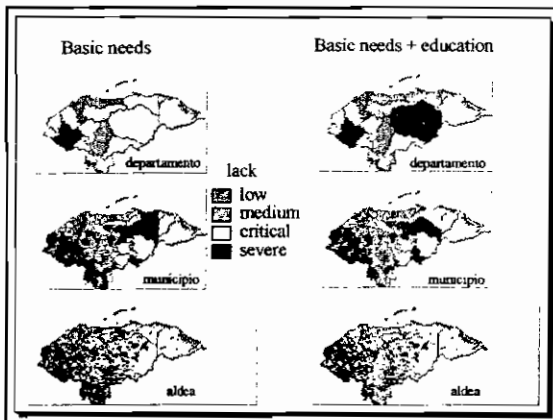
Basic needs satisfaction index: This is a combination of household type, basic services (water, electricity, latrines), non-land assets (bicycle, sewing machine, refrigerator, etc...)

We can also add an education index (adult literacy, school attendance, etc..)

Indices are aggregated from raw census data by defining 5 poverty strata and 1 no/bad data.

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Other approaches

In contrast to the classic approach (computation of indices), researchers want to know what is the people's perception of poverty (example: Well-being ranking)

- ...participatory approaches should allow us to discover factors that are unforeseen
- ...ranking not extrapolable *a priori*

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The problems with both approaches

- the global indices are often considered valid at local level
- the local perceptions are generally considered invalid outside of the community

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The solution

- Extrapolate findings from participatory research to get the attention of decision makers
- Validate indices developed for global estimates based on the results of participatory research
- Put the information accessible to the community and decision makers

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Solution: Extrapolate Well-Being ranking

- Sampling for careful selection of sites
- Participatory grouping into 3+ poverty levels
- Descriptors lead to indicators
- Neural Networks are used to find the sensitivity of the indicators
- Indicators made quantifiable in the form of a household questionnaire (->index?)

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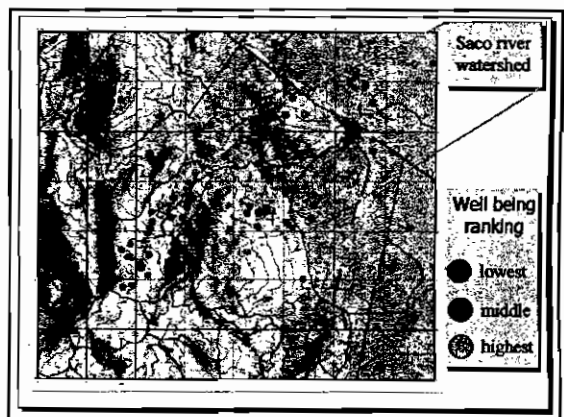
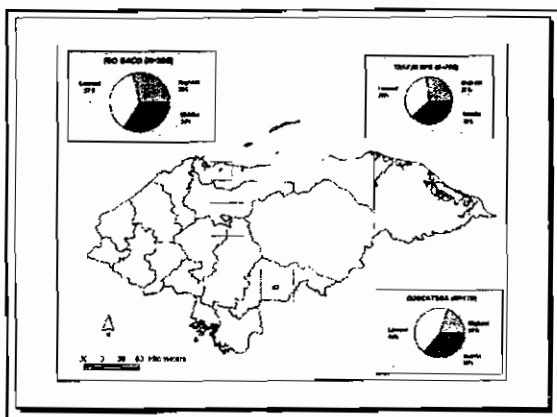
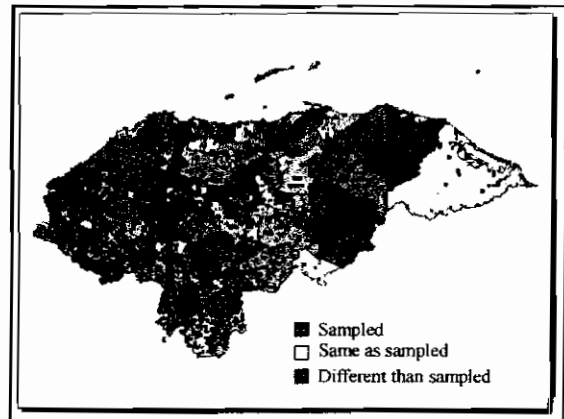
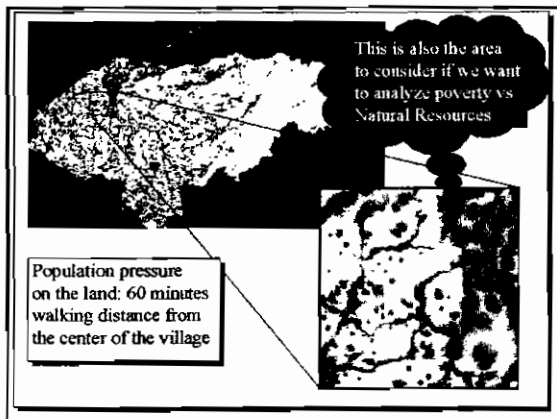
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11 WB indicators

- Land
- Day laboring
- Income
- Cattle
- Savings
- Health
- Agriculture
- Food
- Housing
- Animals
- Use of day laboring

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Solution: Validate indices

- Proxy to WB indicators found in census (principal correspondence plots)
- Neural Networks can help build proxy composite indicators
- 5 (out of 11) questions related to WB indicators found in the 1988 Honduras housing and population census.

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Solution: DSS

- The power of household level info... in your hands !
- cook your index: put on the www
- The community: 'how do we compare; have we improved?'
- Communicate to the people with the power
- empowerment and governance are the real solutions

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Mapping...beautiful maps?

- Even if you can map poverty at village level, there are no mechanisms for action at this level
- do we trust our map (are we simplifying too much)?

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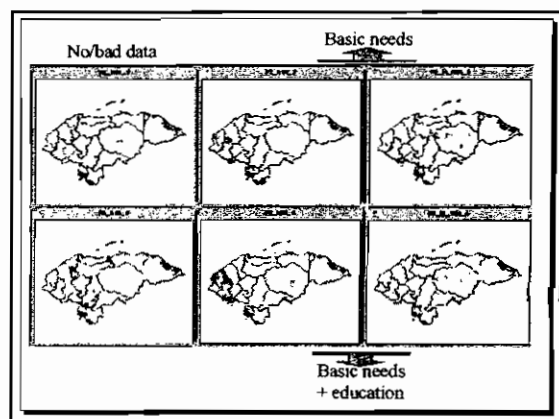
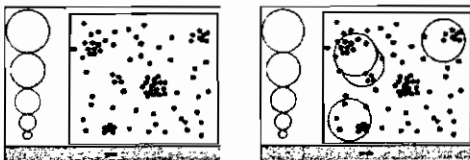
Beyond mapping

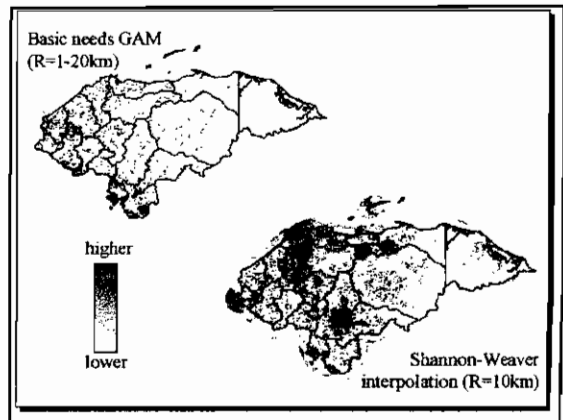
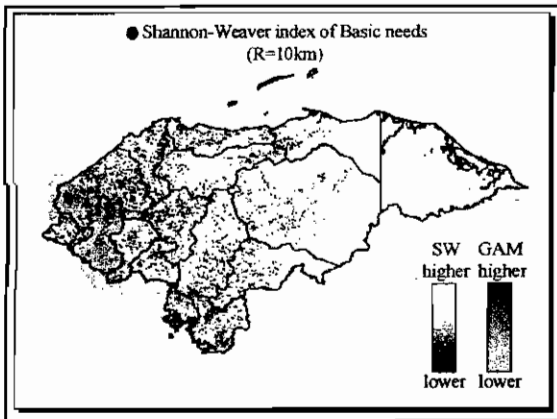
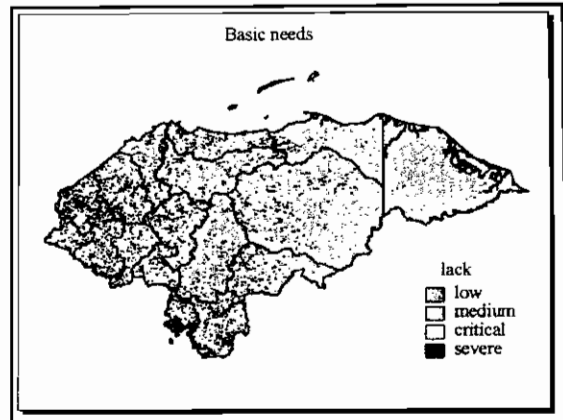
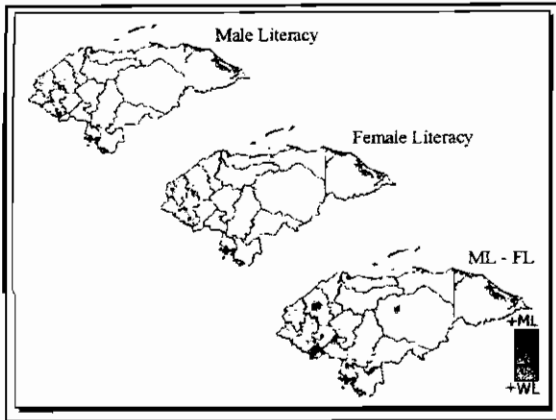
- Methods to find structure hidden in the data
- Methods to process data at different scales
- Decision Support Systems

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The Geographic Analysis Machine (GAM)





Poverty vs NR: causality?

- ⌚ Poverty trap: elegant but...
- ⌚ Risk of wrong findings if analysis not done well. Example: policy opens state land to refugees: we find that the poor are cutting the forest (or no forest induces poverty)
- ⌚ data is scarce, not timely, etc..
- ⌚ Scale is important

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Bennett and Gutzwiller

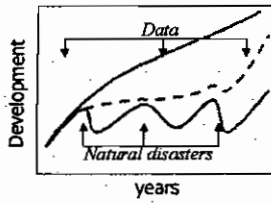
Some hypotheses

- ⌚ Agroecological potential and poverty
 - ⌚ climate, climatic risk, soils, slope
- ⌚ Influences
 - ⌚ population density, ethnicity, migration, transportation network, land degradation (erosion)
 - ⌚ Export crops

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Bennett and Gutzwiller

The unplanned



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Some problems

- 1 Conceptual
- 2 Scale
- 3 Analysis at detailed level
- 4 Data
- 5 Methods
- 6 Policies

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An example of scale problem



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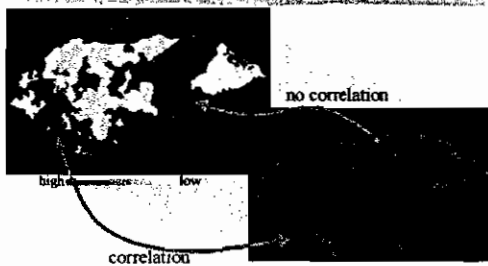
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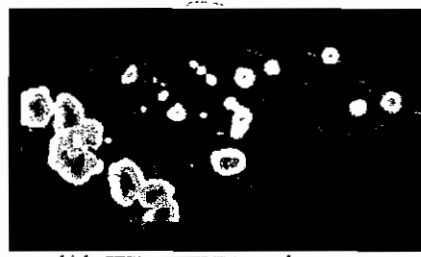
What is the relationship?



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What is the relationship?



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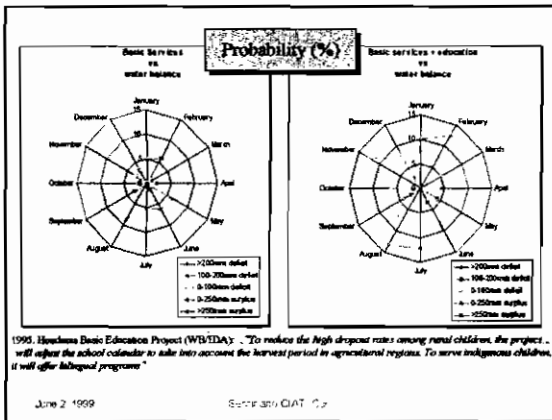
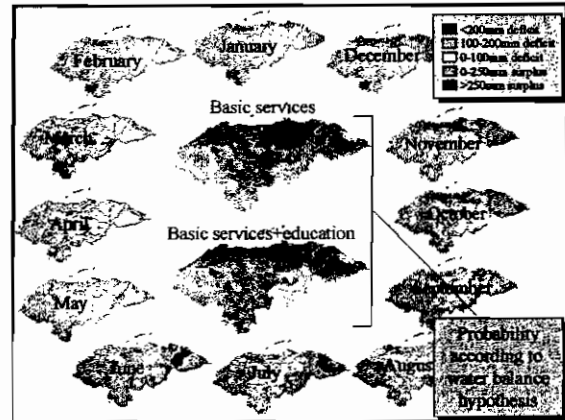
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Other example: poverty vs water availability

- 1 We start with a hypothesis: poverty is related to water balance
- 2 We compute the probability of being poor in each water balance zone
- 3 This is another way to filter the data (remove the noise), according to a hypothesis

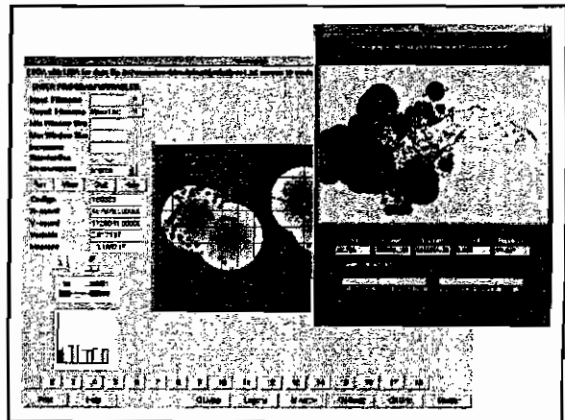
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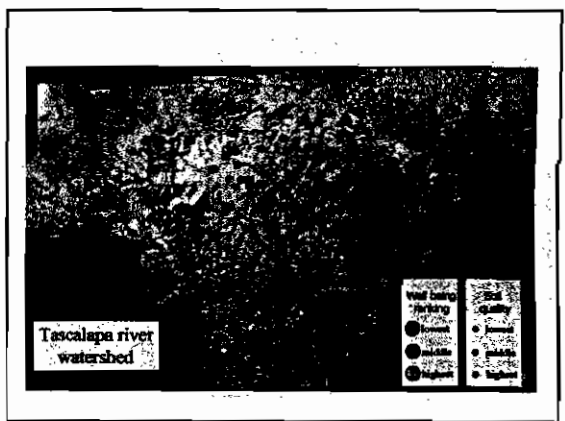


But there are too many factors to consider!

- 1 Data analysis is not sufficient:
 - 2 We have to understand poverty in the country, do a retrospective analysis
 - 3 We have to start with in-depth analysis at the local level to narrow-down the range of possible causes and effects of poverty
 - 4 We may want to ask ourselves: what is our range of action, and concentrate on what we can do well

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Some "real" relationships with respect to NRM

Factors that depend on poverty levels

- 1 Food security, health
- 2 Land tenure
- 3 Type of animals, crops
- 4 Own natural forest
- 5 Source of fuelwood
- 6 Soil management, tillage method
- 7 Transportation

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Factors that depend on where people live

- 1 Food security, health
- 2 land tenure
- 3 Type of animals, crops
- 4 Own natural forest
- 5 Source of fuelwood
- 6 Soil management, tillage vs slope, soil problems
- 7 Transportation
- 8 Maize and beans varieties

What has to be done

- need for analysis of policies, social and environmental conditions
- Add time dimension in most studies
- -> huge databases?
- Water balance -> crop risk (more meaningful variables)
- ...and methods (spatial and data mining, fuzzy sets, probabilistic methods)!

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Where will we end-up?

- 1 We will have user-friendly tools to help Decision makers take poverty into account (data mining, GIS, statistics)
- 2 ..then we will be able to consider more factors to characterize poverty (policies, natural disasters, local knowledge)
- 3 ..and will separate the myth from the reality with respect to cause/effects between poverty and NRM

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